| PROVISIONAL PATENT APPLICATION UNDER §111(b) | Attorney Docket No. | 010416-9001 |
|---|---|---|
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| | Express Mail Label No. | EV 054571765 US |

Assistant Commissioner for Patents
Box Provisional Patent Application
Washington, D.C. 20231

Sir:

    Enclosed for filing is a complete provisional patent application entitled "ONBOARD SERVICES SYSTEM" invented by:

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and including the following documents:

    Specification - 7 pages
    Drawings - 1 sheet
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Date: March 17, 2003

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## Provisional Patent Application for

## ONBOARD SERVICES SYSTEM

### Field of the Invention

The invention relates to a system and an interface device for use, among other things, in
5    vending products, processing cash and credit transactions and tracking inventory on a vehicle such
as, for example, an airplane, a boat or a bus.

### Background of the Invention

An employer reportedly invented the mechanical cash register in 1879 to prevent sales
clerks from stealing.  More than a century later, the problems of accounting for retail sales
10    proceeds and inventory persist.  Salespeople are entrusted with valuable merchandise and the
proceeds from sales.  Problems continue to arise in attempting to hold individual salespeople
accountable for their transactions.  Accounting problems are particularly noticeable in
circumstances where salespeople must circulate among customers to transact sales, and where the
transactions are conducted under time pressure.  Both of these circumstances are often present
15    when goods are sold on moving vehicles.

For example, airline attendants traditionally push a cart along a narrow aisle to visit each
potential customer personally and attempt to sell food, beverages, entertainment and other
products.  Interruptions are frequent and the time permitted for selling is limited, especially on
shorter flights.  The customers almost always pay in cash, with correct change being expected in
20    return.  Perhaps as a result, airlines have reported difficulties in recording sales transactions from
onboard sales of duty-free items, liquor, and headsets.  Additionally, traditional inventory
accounting methods do not appear to be practical under these circumstances and much lost
inventory is never satisfactorily accounted for.

Airlines are sensitive to the incremental profit added by on-board, in-flight sales.  With
25    current increases in the cost of security and decreases in the volume of discretionary air travel,
some airlines may rely on the revenue from in-flight sales to keep flying.  Assuming that a
significant fraction of the in-flight sales revenue currently lost to theft could be accounted for and
retained, millions of dollars per year might be saved.  If the practice of selling in-flight meals
separately from the ticket price becomes widespread, as current trends indicate, the potential for

savings will be greater still.

Accordingly, a need exists for a new system for performing and recording transactions in connection with vending products on a vehicle. A system that can be used on a traveling vehicle to process credit transactions and track inventory would be welcomed. The system should be quick

5    and convenient at the point of sale, easy to set up for use, and sufficiently accurate and tamper-proof to be relied upon.

## Summary of the Invention

The invention provides a method and a system for accepting credit card payments and debit card payments on moving vehicles, such as a commercial passenger airplane in-flight, and

10   for tracking sales inventory. The system is based on a user interface device that is supported by a conventional and widely accepted operating system such as, for example, Windows 2000™ offered by Microsoft Corporation. The user interface device includes software to adapt the operating system to the particular applications of accepting payments and tracking inventory and hardware.

15   The first step of the inventive system is linking the user interface device of the present invention to an operating system for an initial or pre-sale configuration. Pre-flight configuration employs a personal computer-based application program, which loads base criteria for each terminal into the respective user interface device. Examples of the base criteria are flight information and the menu content for a particular flight. The pre-sale loading is performed most

20   efficiently when the vehicle is at rest, preferably before a scheduled trip.

Subsequently, one or more flight attendants carry the user interface device with them as they circulate among the passengers to take food and drink orders during the flight. The user interface device, which preferably has a touch screen display that allows the attendant to quickly and easily select requested items, stores in its memory the type of items selected and their

25   quantity. The user interface device employs this information to calculate the cost of each order, including tax where necessary. The user interface device also uses this information to track inventory. In a preferred embodiment, the user interface device includes a thermal pointer for selecting particular items from various on-screen menus.

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The customer may select payment in cash or by credit card. Means for swiping and authorizing credit cards is mounted on the user interface device. In a preferred embodiment, a magnetic-stripe reader is mounted on the user interface device. A printer is also provided for printing a receipt of the transaction.

5    After the sales session is completed, the user interface device is linked to an "on-line" terminal for post-flight synchronization. The post-sales session may be performed when the vehicle is stopped, for example, upon arriving at the vehicle's destination. Alternatively, the post-sales session may be accomplished through a wireless Internet or other connection while the vehicle is moving.

10    During the post-flight synchronization, stored data from the user interface device is loaded into an on-line terminal by use of a personal computer-based application program, ideally the same application program and type of terminal that was employed for the pre-flight configuration. The terminal routes the data from the user interface user device to a transaction settlement engine and to an offline reporting engine. The user interface device is then cleared of
15    data and prepared for another pre-sales configuration cycle.

The settlement engine settles the transactions and results are routed to the offline reporting engine. The off-line reporting engine creates a relational database, which may be used to perform multidimensional data analysis of multiple airlines and catering locations, and to prepare comprehensive reports.

20    **Brief Description of Drawings**

Figure 1 is an activity diagram of the present invention; and

Fig. 2 is a perspective view of a personal digital assistant cradled in a detachable printer.

**Detailed Description of Preferred Embodiments of the Invention**

In a preferred aspect, the invention is a method for accepting cash payments, credit card
25    payments and debit card payments on moving vehicles and for tracking sales inventory, including the activities symbolized in Fig. 1. The method can be performed using a system based on a user interface device that is supported by a conventional and widely accepted operating system, such as Windows 2000™ offered by Microsoft Corporation. In order to better communicate the invention, the user interface device described in this example is a personal digital assistant ("the

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PDA") 80, that works in conjunction with a Windows™ operating platform offered by Microsoft Corporation, such as Windows 2000 and/or Windows Pocket PC 2002. For example, the PDA 80 can be a pocket computer such as Hewlett Packard's iPAQ , Compaq's IPAC, and Palm Pilot's Palm V, among others. Preferably, the PDA 80 is Hewlett Packard's iPAQ equipped with a

5    detachable printer 90 such as, for example, Infinite Peripheral's PP-50MS printer, which includes a magnetic strip reader and is depicted in Fig. 2.

Referring now to Fig. 1, the method includes pre-flight configuration 10, in-flight terminal functions 20, post-flight synchronization 30, transaction settlement 40, and off-line reporting 50. The method starts 2 with the supplying caterer performing pre-flight configuration 10. One or more

10    flight attendants perform in-flight functions 20. Subsequently, the supplying caterer executes post-flight synchronization 30. In the course of flight synchronization 30, the supplying caterer uploads the results of synchronization 30 via an on-line terminal to an on-line transaction engine, which performs settlement 40 and reports to an independent analyst. The supplying caterer then must decide 34 whether to continue 36 his participation in the method by preparing the PDA for another

15    session of pre-flight configuration 10 or, alternatively, to end 38 his participation. In either case, the analyst performs offline reporting 50, which includes comparing settlement 40 results with synchronization 30 results reported by the supplying caterer, creating a relational database and preparing ad hoc reports based upon the multidimensional data.

A coded application program that has previously been stored in each PDA 80 permits the

20    base criteria for each PDA 80, respectively, to be loaded. The base criteria are loaded from an on-line network terminal or an Internet-linked terminal to the PDA 80. Preferably, the downloading is conducted through an infra-red data link or other automatic data-communicating interface device.

The base variables may be, for example, flight information and menu contents. Flight

25    information includes, for example, flight number, originating airport, departure time and date, destination airport, arrival time and date, supplying caterer, the PDA identification number, and attendant identification number. Menu content includes, for example, menu items and prices that are entered into the network by the supplying caterer. Preferably, the menu content is dynamically downloaded into the PDA 80 via a standard PDA 80 cradle. A typical menu

30    includes two different sandwiches, a fruit bowl, a salad, soft drinks, beer and spirits.

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The attendant works with the PDA 80 during the flight to execute in-flight functions 20 by means of a touch screen included in the PDA 80. The touch screen requires no stylus or special scripting for operation. The PDA 80 tracks the attendant's identification number for each transaction. The attendant need not input his or her identification number before each transaction.

5    The current attendant identification number is continuously visible and easily confirmed by the attendant. In addition to tracking the attendant's identification number, in-flight functions 20 include inputting menu items by type and quantity (with the ability to correct mistakes before the order is accepted) calculating cost and applicable tax, accepting the order, transferring the order to payment, and printing a receipt.

10    The PDA 80 can accept payment by cash or by a number of credit cards and debit cards. The PDA 80 accepts credit cards that are commercially available through Visa, MasterCard, American Express, Discover, Diners Club, JCP, and Carte Blanche, among others. Each of these credit cards can be recognized and accepted based on the information obtained by the PDA 80 when the credit card is swiped through an onsite reader. The PDA 80, which is normally used off-

15    line while the vehicle is traveling, compares the credit card information to periodically updated lists that are stored in the PDA 80 prior to or during pre-flight configuration 10. The results of this comparison determine whether the PDA 80 accepts the payment or immediately voids the sale. Alternatively, in cases where the PDA 80 is connected to a network or an Internet link at the time of the sale, the PDA 80 can authorize or reject the credit card payment based on a search of on-line

20    data.

The receipt produced by printer 90 contains information about the flight such as, for example, flight number, originating airport, departure time and date, destination airport, arrival time and date, supplying caterer, the PDA identification number, attendant identification number, transaction number, and a selectable logo image. The printed receipt also lists the items sold by type

25    and cost, the sales tax, and the total cost of the transaction. If payment is in cash, the printed receipt shows the amount tendered and the change returned. If payment is by credit card or debit card, the printed receipt shows the name of the card holder, the type of credit card used, significant card numbers, and the expiration date. If the total cost of a credit transaction is over a certain amount such as, for example, $25.00, the printed receipt includes a line on which the customer is requested

30    to place his signature. The transaction is typically completed in about one minute or less.

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When queried, the PDA 80 reports terminal variables such as cash, credit, cash versus credit, and credit card by type. Variable reports that are available include transaction amount totals for specified variables and transaction occurrence totals for the variables. Item report categories include food, liquor, food versus liquor, food by type, and liquor by type. Item reports may also be

5 created for transaction amount totals for specified item categories and transaction occurrence totals for the categories.

During post-flight synchronization 30, data from the PDA 80 is loaded into a networked terminal or an Internet-linked terminal through the use of a personal computer-based application program similar to the one used for pre-flight configuration 10. The PDA 80 data is processed for

10 and routed to either a transaction settlement engine or an offline reporting engine, as described below. The PDA 80 is then cleared of data in anticipation of a future pre-flight configuration 10.

Transactions settlement 40 is facilitated by a specialized transaction engine. Post-flight synchronization 30 formats the PDA 80 to conform to the specifications of the transaction search engine. The settlement 40 process is typically completed within forty-eight (48) hours.

15 The offline data reporting engine accepts data from the on-line terminal that performs post-flight synchronization 30 and from the transaction settlement engine. The offline reporting engine loads the data into a common relational database, encompassing the history of many flights and time periods. By utilizing this information through a Web interface, analysts can build comprehensive reports. Multidimensional data analysis of multiple catering locations, airlines, and

20 the like is contemplated.

While only a few, preferred embodiments of the invention have been described above, those of ordinary skill in the art will recognize that these embodiments may be modified and altered without departing from the central spirit and scope of the invention. The preferred embodiments described above are to be considered in all respects as illustrative and not restrictive.

25 **That which is claimed is:**

1. A method for accepting credit card payments on moving vehicles and for tracking sales inventory, the method comprising:

linking a user interface device to a terminal having an operating system for pre-sale configuration;

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loading base criteria from the configuration terminal into the user interface device;

inputting sales transaction data into the user interface device data via a touchscreen display;

calculating the total cost of the sales transaction and updating the status of inventory;

5       swiping and authorizing a credit card for payment of the sales transaction;

printing a receipt for the sales transaction;

linking the user interface device to a terminal having an operating system for post-flight synchronization;

loading sales transaction data from the user interface device into the synchronization

10     terminal;

routing sales transaction data from the synchronization terminal to a transaction settlement engine and to an offline reporting engine; and

settling the sales transaction and routing results of the transaction settlement to the offline reporting engine.

15

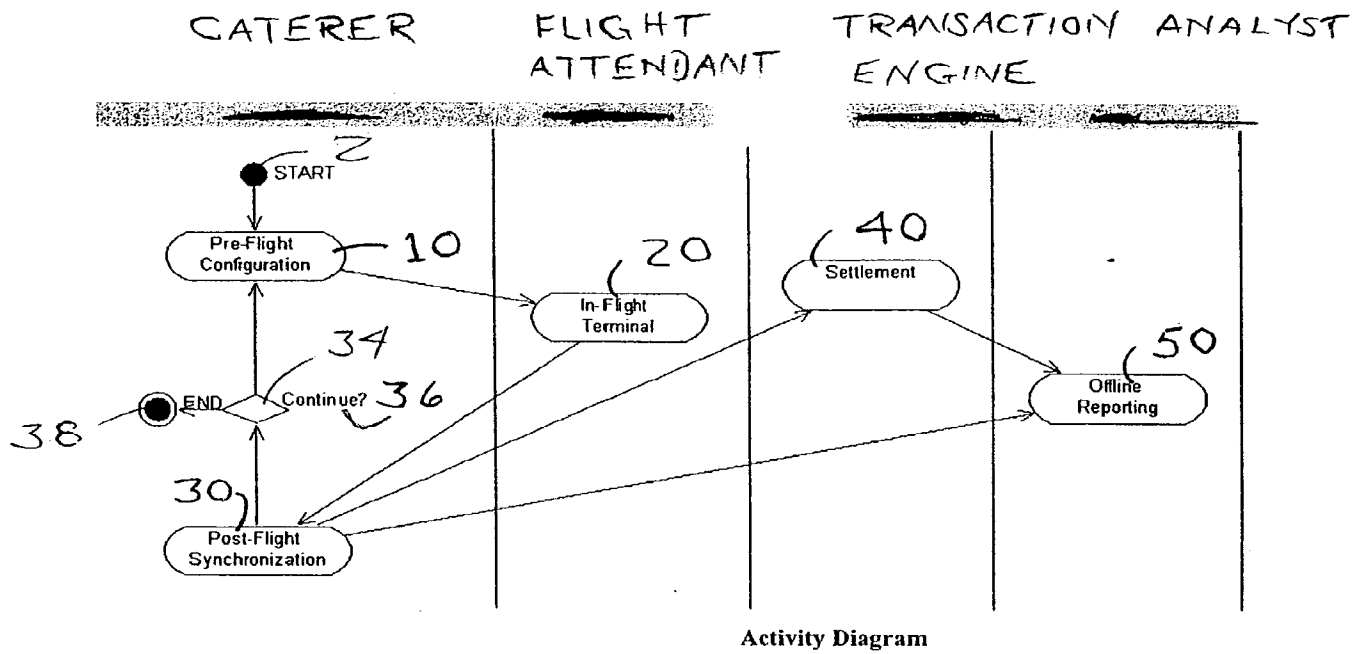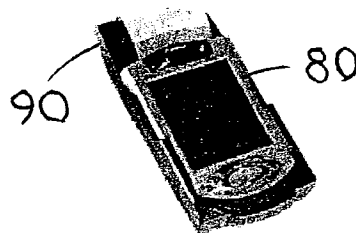20     S:\CLIENT\010416\9001\C0198753.2

CATERER     FLIGHT     TRANSACTION ANALYST
              ATTENDANT     ENGINE

START  ~2~

Pre-Flight
Configuration  ~10~

~20~

In-Flight
Terminal

~40~

Settlement

~50~

Offline
Reporting

~34~

END  Continue?  ~36~

~38~

~30~

Post-Flight
Synchronization

**Activity Diagram**

Fig. 1

~90~  ~80~

Fig. 2